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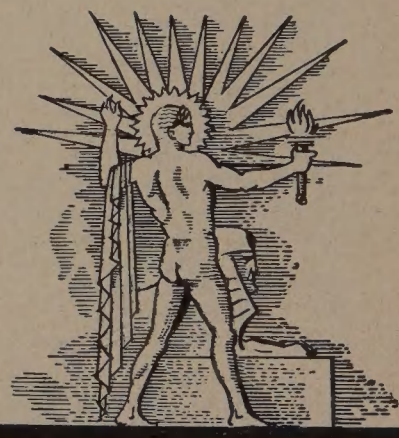
# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



APRIL 4, 1931

**Paschal Flower of the Prairies**

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A SCIENCE SERVICE PUBLICATION

# SCIENCE NEWS LETTER

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The Weekly Summary of Current Science

*Published by*

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*Edited by* WATSON DAVIS

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## DO YOU KNOW THAT

The foggiest spot in the United States is Moose Peak Lighthouse, Maine, at the mouth of the Bay of Fundy.

The muscles in a beaver's tail are very powerful, and the beaver can use them to turn the tail in almost any direction desired.

Human beings who contract parrot fever, or psittacosis, develop a type of localized pneumonia which is especially dangerous to elderly people.

The Hawaiian Volcano Observatory reports that about 20 important volcanic crises have occurred during the past 20 years in the volcanoes Kilauea, Mauna Loa, and Hualalai, or about one a year.

Honey bees born in the early summer, when the nectar-gathering season is in full swing, live but a brief six weeks, while those born after the rush season have an average life of seven months.

Highly seasoned "barbecue" meat was popular in Roman times.

In one German museum, in place of guides there are phonograph records which describe the exhibits to visitors.

Rubber mirrors that bounce but do not break are a new product which may make life simpler for the superstitious.

A process has been announced for the removal of tar specks on woolen and worsted fabrics.

Wall paper that can be washed with soap and water is being manufactured.

Moving pictures of the animated cartoon variety are being used to teach designing to students at Cornell University.

A Soviet Arctic expedition will use a wooden ship to test the usefulness of wooden vessels for navigation through icy seas.

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*Science Service presents over the radio, an address*

AIRCRAFT ENGINES

By Dr. H. C. Dickenson, Chief of the Heat and Power Division of the National Bureau of Standards of the U. S. Department of Commerce,

Friday, April 10, 3:45 P. M., Eastern Standard Time

*Over Stations of*

The Columbia Broadcasting System

PHILOSOPHY

# Because World Is Not Wholly Reliable It Has Human Meaning

## Dr. A. H. Compton Suggests Uncertainty Principle Allows Choice Through Brain to Determine Future

Only because the world in a physical sense is not wholly reliable can it have any human meaning, Prof. A. H. Compton of the University of Chicago, Nobel prize laureate in physics, declared in the concluding lecture of a series at College of the City of New York last week.

This important philosophical deduction from the new principles of physics, introducing a new discussion of "free will," is expected to cause great interest.

The following is a special summary of his lecture prepared for Science Service.

### By DR. A. H. COMPTON

"MAN'S greatest discovery of all time is that he can count on the world in which he lives."

This, in effect, was a statement made by Prof. R. A. Millikan only a few years ago, and rightly. For is not the reliability of nature the very bedrock on which the structure of science is built?

Yet, Prof. W. Heisenberg in his *The Physical Principles of the Quantum Theory* published in 1930, writes:

"The resolution of the paradoxes of atomic physics can be accomplished only by further renunciation of old and cherished ideas. Most important of these is the idea that natural phenomena obey exact laws—the principle of causality."

Does this mean that science, with its continual searching of fundamentals, has finally undermined its own foundations?

As one whose experiments are partly responsible for this dramatic reversal of the physicist's point of view, I have been especially interested to trace what the significance of this change may be to human life and thought. Why does Heisenberg say that nature does not obey exact laws, and how does this new doctrine affect the hoary problem of man's freedom and morality in the world of law?

It makes one pause when he finds that a flourishing science was once dealt a death blow by the philosophers because it seemed to remove the basis of morality. The early Greek science had as its main objective the finding of the purpose of life. According to the Atomists, not only stones and air, but life and thoughts as well were explained in terms of the motion of atoms. The whole world of planets and plants and people had been reduced to a vast machine.

This, Socrates clearly saw, left no room for that freedom of choice which is the basis of morality, whereas his reason told him that mind was the controlling factor in men's actions. Science thus to the Greeks lost its value. By the beginning of the Christian era the light of science had gone out. Why? It had failed to illumine man's path of life.

The modern revival of science reached its climax when Isaac Newton established the laws of motion, and showed how, by introducing the simple concept of gravitation, harmony came into the motion of the planets. As a consequence arose the so-called "scientific viewpoint," according to which the really important world is hard, cold, colorless, silent and dead; a world of quantity, a world of mathematically computable motions in mechanical regularity.

Though men were thus logically reduced once more to automata, if nature was one unbroken chain of law, scientists sought to learn that law to master nature. Let the philosophers worry about the fact that strife for mastery is meaningless to a man who is merely a link in that unbroken chain. The man of science must not pause to consider that if his own actions are "with a cause and by necessity" he cannot in truth "make a search" at all.

Now, Heisenberg tells us, science must abandon its cherished law of causality. Nature does not obey exact laws.

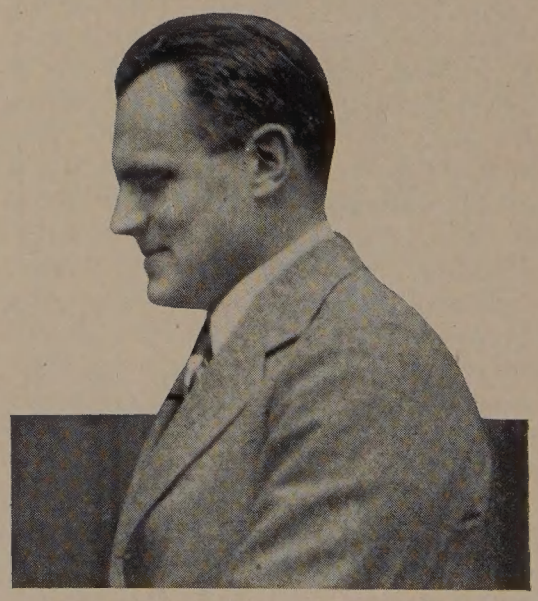
This statement of Heisenberg's is a consequence of the fact that any observation of the present state of a system disturbs that state, so that its future state cannot be exactly predicted. The disturbance arises because the system must effect at least one photon, or electron or proton, and in any case the reaction will disturb the system's own motion by an unknown amount.

Thus from the fact that light has the form of particles and electrons, the form of waves, it follows of necessity that experiments with light or electrons cannot reveal the future with precision. It is thus as an experimental, or physical principle that the law of causality must be abandoned.

Heisenberg has shown that if the principle of causality is replaced by his principle of uncertainty, all those paradoxes of atomic physics that have been classed as "quantum phenomena" find a ready solution. This includes such things as the photoelectric effect, the emission of light, etc. Nor has the classical dynamics as applied to large scale phenomena been in any way affected. Thus science has gained by introducing this flexibility into its cherished law of cause and effect.

Does this flexibility open any way in which the physically undetermined actions of a living organism may be determined by non-physical means, without violation of the laws of the physical world?

It is not impossible that choice might alter the statistical distribution of the motion of the particles in a brain current. Such an alteration might well determine the action of the organism, and would not violate any fundamental principle of science, as was the case when science demanded that the effect



DR. A. H. COMPTON

be the necessary consequence of the cause.

Nature is not altogether reliable. Yet if we mean by science the organized body of tested truth, such tested truths are eternally reliable. By learning these truths man can still use Nature as his servant. It is, indeed, only because the world in a physical sense is not wholly reliable that it can have any human meaning.

*Science News Letter, April 4, 1931*

CHEMISTRY

# Rays, Atoms and Vitamins Discussed by Chemists

## Ergosterol Made Source of Vitamin D by Radium Rays; Detection of Drunkenness by Breath Analysis is Improved

NEW DRUGS to treat diseases and new chemicals to make more comfortable lives for human beings were revealed at the meeting of the American Chemical Society in Indianapolis this week. Over 6,000 chemical workers from universities and research laboratories all over the country assembled to discuss the results of their scientific experiments during the last year.

Specialists in the chemistry of agriculture, foods, medicine, fuels, engineering, rubber, and in physical and organic chemistry reported important developments to their colleagues.

Anesthetics and other chemicals important in the workings of the human body formed the subject of one special meeting.

Leading mathematical physicists, including Dr. Saul Dushman of the General Electric Company and Prof. R. H. Fowler of Cambridge University, England, revealed to the assembled chemists the applications to chemistry of new discoveries in mathematical physics.

### Radium as Source of Vitamin D

Possibility of radium playing a role in vitamin production, at least in the laboratory, appeared when Prof. Thomas DeVries of Purdue University announced to the meeting that he and his former colleague, the late Prof. Richard B. Moore, had succeeded in activating ergosterol by radium rays. Activated ergosterol is a potent source of vitamin D, it has been shown by Prof. Harry Steenbock of the University of Wisconsin. The Steenbock method, which has been patented, activates the ergosterol by ultraviolet rays.

The radium-activated ergosterol reached a degree of potency equal to one thousand times that of a good grade of cod liver oil or one-hundredth of that obtained by the Steenbock ultraviolet ray method, Prof. DeVries reported.

"Radium-activated ergosterol is not yet commercially feasible," he said in reply to a Science Service inquiry. Patents are pending on this method.

### Improved Test For Drunkenness

Improvement of a chemical test which will make detection of drunkenness by breath analysis more accurate was reported by Dr. Rolla N. Harger of the Indiana University School of Medicine.

Previous attempts to estimate the concentration of alcohol in the body by analyzing the breath have given quite erratic results, Dr. Harger explained. This is probably because the breath analyzed was not always air from the alveoli or air-cells in which exchange of oxygen and carbon dioxide between the blood and the lungs takes place.

By the new method, the alcohol and carbon dioxide contents of the breath are determined simultaneously. Since the carbon dioxide content of alveolar air is constant, this gives a means of estimating the alveolar alcohol in any sample of breath.

This method was used on a number of intoxicated subjects and the alcohol figure so obtained agreed well with the concentration of the alcohol in the blood determined directly.

### Study Auto Knock

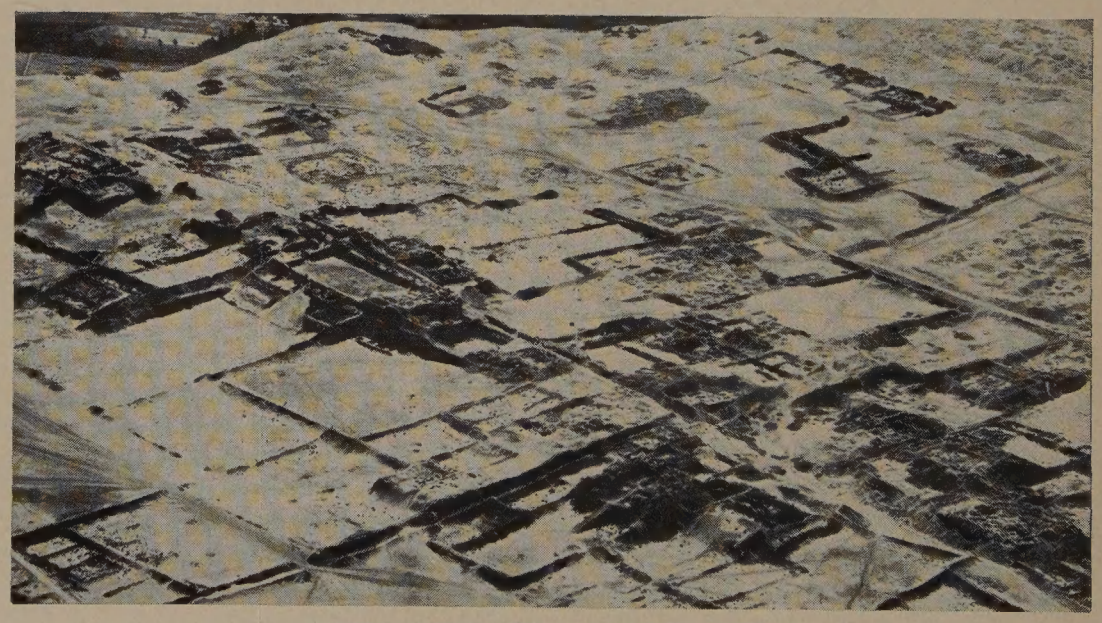
Photographs of individual explosions in a gasoline engine were shown by Dr. Lloyd L. Withrow and T. A. Boyd of the General Motors Research Laboratories.

Much interest was caused by their report that "the products of combustion continue to emit light for some time" after the main burning process is over. Before this happens a narrow sheet of flame travels steadily through the charge and most of the burning takes place in this zone.

The brightness of the afterglow increases with increasing pressure of the gases during the explosion. The method has been used to identify and study "knock" in auto engines.

*Science News Letter, April 4, 1931*

A full-grown apple tree has approximately 50,000 leaves.



HOLY CITY OF ANCIENT PERU

***"This town is larger than Rome" wrote one of the Spanish conquerors after seeing Pachacamac, in Peru. Now, the city has again shown its impressive size, this time from the air in a photograph taken by the Shippee-Johnson Peruvian Expedition. Pachacamac's fame goes back to pre-Incan days, when it was a shrine of the creator-god Pachacamac. A great temple in the city was the goal of throngs of Indian pilgrims who came from great distances. Then, the Incas added that part of Peru to their great empire. At Pachacamac they added a temple for the worship of the Sun to the ancient temple of the creator-god.***

MEDICINE

# Test Devised for Measuring Efficiency of the Heart

## College of Physicians Also Told of Research Revealing the Cause of Diseases and New Methods for Combating Them

A NEW test for heart efficiency was reported by Dr. Allen Eustis of New Orleans to the American College of Physicians, meeting in Baltimore last week.

The test is a valuable aid in the diagnosis and study of the type of heart disease known as myocardial insufficiency. The test may also be used with caution in cases of marked enlargement of the heart, angina pectoris and certain cases of high blood pressure. By means of this test the physician will have a new gauge of how well the diseased heart can function. The test depends on the rise in the systolic blood pressure following an increase in pressure within the chest caused by forcible expiration of the full breath under a definite amount of pressure. Dr. Eustis reported that clinical evidence corroborated the results of the test.

How chemicals known as nitrites act in relieving the agonizing pain of angina pectoris was discussed by Dr. Alex M. Burgess of Providence, R. I. From a large series of studies of normal and diseased hearts Dr. Burgess concluded that the action of the nitrites in increasing circulation in the coronary arteries is what relieves the excruciating pain. The cause of the pain in ambulatory angina, the type in which the patient is up and about, is probably an insufficient blood supply due to disease of coronary arteries, Dr. Burgess explained.

Use of oxygen in heart disease by a specially devised oxygen chamber or tent which keeps the temperature and the humidity at a comfortable level was described by the designer of the apparatus, Dr. Alvin L. Barach of New York City.

### Liquor Not Blamed

Liquor was absolved from blame as being the chief cause of cirrhosis of the liver by Dr. A. M. Snell of the Mayo Clinic, Rochester, Minnesota. Dr. Snell said that, contrary to generally accepted opinion, alcoholism caused cirrhosis in only half the cases of the disease. Furthermore, cirrhosis appears in only five per cent. of all alcoholic individuals.

The outlook for the patient suffering from this highly fatal disease is better now than it was years ago, Dr. Snell said, but it is still serious, particularly for advanced cases. Physicians are trying now to recognize the disease in the earlier stages when it may still be cured. Some of the early symptoms may be indigestion, weakness, vague abdominal pains and occasionally painless jaundice. Dr. Snell reported good results are obtained in some cases by newly devised operations for controlling bleeding from enlarged veins in the esophagus that are invariably present in cirrhosis.

Carbohydrates are of great value in the diet of animals suffering from extensive liver disease, Dr. J. L. Bollman, also of the Mayo Clinic, reported. A diet rich in sugar and starch will protect the liver from damage by poisons and will aid in its recovery after such injury, he found from his studies of animals.

*Science News Letter, April 4, 1931*

**WORSHIPPED IN UR 2000 B.C.**

***When Abraham spent his boyhood days in Ur of the Chaldees, goddesses like the one in the picture were familiar objects. The goddess is represented in a bas relief of terra cotta, two and a half feet tall. She wears a long flounced skirt and on her head a horned headdress. The vase she carries is like a fountain from which streams of water flow. The goddess, unearthed in the ruins of a dwelling, is one of the most recent discoveries reported by the expedition of the University of Pennsylvania Museum and the British Museum.***

ANTHROPOLOGY

# Stone-Age Men in Asia Probably Ate Ostriches

SIBERIANS of the Old Stone Age were probably like Noah, who according to Chesterton,

> ". . . had an ostrich farm, with fowls on the largest scale;
> "He ate his eggs with a ladle, from an egg-cup big as a pail."

At least, if they didn't herd ostriches, they very likely hunted them. For in the region beyond Lake Baikal in Siberia, Dr. A. Turgarinov of the Zoological Museum in Leningrad has been finding quantities of ostrich egg-shell fragments, many of them associated with stone tools of paleolithic date and some pierced with holes showing human workmanship.

This establishes a new "far north" for prehistoric ostriches, which are now confined to the comparatively low latitudes of northern Africa and Syria. The belief that the birds were really there, and that the shells were not carried in by man, is supported partly by the large number of the finds and especially by the discovery of at least one deposit of shells with no trace of human artifacts.

The ostriches, as nearly as can be judged from the shells, were related to the species now found in northern Africa.

*Science News Letter, April 4, 1931*

ASTRONOMY

# April 9, 30 A. D. First Easter, German Investigator Declares

THE EXACT date of the first Good Friday was April 7 in the year 30 A. D., and the first Easter Sunday was on April 9.

This is the claim of Prof. D. Oswald Gerhardt of Berlin, based on astronomical calculations and historical research, as set forth in the German scientific magazine *Forschungen und Fortschritte.*

The first step in Prof. Gerhardt's chain of evidence is the date given for the baptism of Jesus by his cousin John, in the Gospel according to St. Luke. This states that this event, marking the beginning of Jesus' public life, occurred in the "fifteenth year of the reign of Tiberius Caesar." Tiberius became emperor on the death of Augustus, in 14 A. D. This would put his fifteenth year in 29 A. D. or possibly in 28.

There is, however, one possible source of error. Two years before his accession as emperor, Tiberius was accorded imperial honors by proclamation of Augustus. Coins were struck with his image on them, the highest privilege of an emperor, as early as the year 12 A. D. Therefore there is a chance that his "reign" may have been counted as beginning two years before the death of Augustus. This would set the possible date of the beginning of Jesus' public ministry as early as 26 A. D.

Support for this earlier date is found in the statement in the second chapter of the Gospel according to St. John, that after His baptism Jesus made a visit to Jerusalem, the Temple being then 46 years from its foundation. Since the date of the beginning of the Temple is known from independent sources, this visit seems to have occurred in the spring of 27 A. D.

The public life of Jesus covered a period of more than three years but less than four. This would set the year of His crucifixion and resurrection as about the year 30. To make allowances for all possible sources of error, Prof. Gerhardt adopts a "bracket" of five years, 29 to 33 A. D. inclusive.

With this he begins his astronomical calculations to determine the exact date. Gospel accounts state that the crucifixion took place on the eve of the Sabbath of Passover, on the fifteenth day of the month Nisan. The problem then became one of determining the year on which Nisan 15 fell on Friday.

The Jewish calender, like all ancient time-reckonings in the East, was reckoned on the changes of the moon. A month began on the evening when the first light of the new moon became visible. With the assistance of data prepared by a number of other astronomers, Prof. Gerhardt has been able to reconstruct the Jewish calendars of the five years in question, and finds that the fateful fifteenth of Nisan on which crucifixion occurred corresponds with the date, according to modern reckoning, of April 7, 30 A. D.

*Science News Letter, April 4, 1931*

ETHNOLOGY

## Dionysos, Greek Wine-God, At First an "All-God"

DIONYSOS, the Greek wine-god known also as Bacchus, was not originally merely a god of wine. He was an "all-god," with power in heaven and on earth, and able to confer immortality on his devotees. Only in the later developments of his cult did he degenerate into a patron of mere bibulosity.

This is the belief of Prof. Johannes Leipoldt of the University of Leipzig, who has been investigating all available materials on the Dionysiac cult in ancient Greece and Rome.

It is not easy to get all the facts about Dionysos, Prof. Leipoldt states, because the doctrines concerning him were kept secret, and his rites were "mysteries" which only the initiate might witness.

Dionysianism was an orgiastic religion, but orgiastic in the sense that it was ecstatic. Dionysos was a nature-god, and his followers accordingly began his rites by costuming themselves as bacchantes, satyrs, Pans, etc. Then they proceeded through the ritual, in which a peculiar dance figured prominently. The knees were pulled up sharply, the arms were thrown out or up, the head was either jerked far back or held down on the chest.

This was supposed to induce, and usually did induce, a state of semi-conscious ecstasy, which was interpreted by the devotees as a visitation by the god himself and an assurance of immortality. The whole proceeding and its results are very suggestive of some of the smaller modern Christian cults.

Wine was originally resorted to as a part of the effort to bring on the ecstatic state, but was not used unless ecstasy could not be produced without it.

The after-effects of such a vehement "attack" of religion, whether with or without wine, were naturally rather pronounced. The state of ecstasy was succeeded by a period of exhaustion. And if the efforts to reach that state were unsuccessful, the unfortunate disciple next day had a bad case of "katzenjammer."

*Science News Letter, April 4, 1931*

PHYSIOLOGY

# Anesthetic Drugs Make Jelly Of Brain and Nerves

COAGULATION or clotting of the liquid protein substances of brain and sensory nerves is the cause of the action of common anesthetic drugs.

A challenge to the chemist is contained in this statement by Prof. W. D. Bancroft of Cornell University to the meeting of the American Chemical Society at Indianapolis. Practically nothing is known about the nature or the properties of these animal proteins, said Dr. Bancroft.

Different proteins occur in different parts of the nervous system for suitable drugs can cause jellying of one region while leaving others untouched. Veronal causes reversible coagulation of the brain proteins without affecting the sensory nerves. Histamine coagulates the proteins of the sensory nerves. Curare causes partial clotting of the motor nerves, while potassium salts affect the proteins of muscle.

Prof. Bancroft's report was presented jointly by himself and Drs. J. H. Richter and J. E. Rutzler, also of Cornell University.

*Science News Letter, April 4, 1931*

ARCHAEOLOGY

## Huge Egyptian Sarcophagus Found by Americans

THE LARGEST sarcophagus ever found in Egypt has been discovered at Meydum by an archaeological expedition from the University of Pennsylvania Museum. The find was reported by Alan Rowe, field director.

"The red granite sarcophagus, which dates to about 2900 B. C., is approximately seven and one-half feet in length, considerably larger than the sarcophagus of Cheops found at the Great Pyramids at Gizeh some years ago," Mr. Rowe stated. "Moreover, it retains its lid, a feature which was missing in the case of the Cheops coffin.

"The sarcophagus chamber, too, is of massive construction and has a roof block over its doorway which alone weighs thirty tons. It is evident, however, that the chamber was built after the coffin was put into place, for the latter, together with its granite lid, weighs about twelve tons and is far too large to pass through the doorway of the chamber."

In its work at Meydum the University of Pennsylvania Museum is concentrating on the excavation of the Great Pyramid of Sneferu.

Following the discovery of the sarcophagus the expedition has now closed its second season's work at the site.

*Science News Letter, April 4, 1931*

METALLURGY

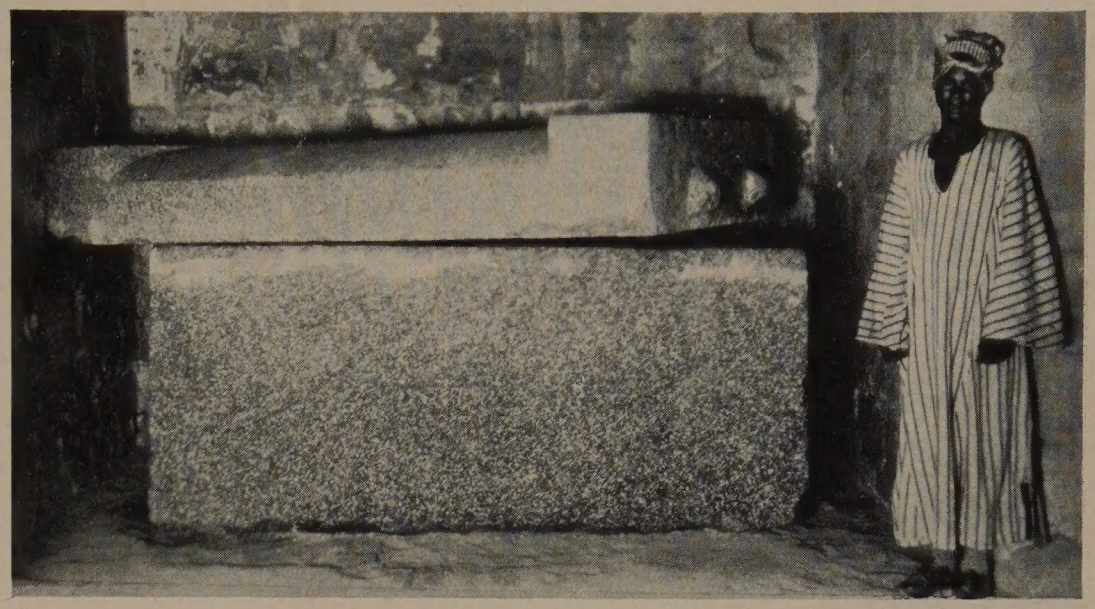
## Early Chinese Bronze Not Like Western Metal

BRONZE making of the early Chinese was entirely distinct from that of the Sumerians who were probably the earliest of the Mediterranean peoples to work in the copper-tin alloy.

Analyses of early Chinese bronzes made by William F. Collins, Peiping engineer, lead to this conclusion. The Chinese bronzes contained high percentages of lead, whereas the Sumerian bronze seldom contained more than one per cent. of lead.

It is considered by many metallurgists that China developed metal working earlier and independently of western civilization. If bronze casting originated independently, Mr. Collins thinks that it began probably in Kansu, Shensi or Honan provinces, sites of the earliest cultures known in China.

*Science News Letter, April 4, 1931*



**EGYPT'S MIGHTIEST SARCOPHAGUS**

***Ponderous Granite Coffin, found at Meydum by American scientists, is larger even than the sarcophagus prepared for Cheops.***

MEDICINE

# Cancer Will Kill 150,000 In United States This Year

"ACCORDING to the best statistics, approximately 150,000 people will die of cancer in the United States in 1931," Dr. William Carpenter MacCarty of the Mayo Clinic, Rochester, Minn., declared recently.

At least two million people in the United States are suffering from cancer, Dr. MacCarty estimated. Many of them have never consulted a physician.

"The disease is more common in women and therefore hits the most important member of the family," he said.

"The disease is recognizable and curable in its early stages.

"It is incurable in its advanced stages.

"Its early stages do not manifest themselves as cancer but as lumps, sores, unusual bleedings, discharges, and protracted indigestion. Patients with advanced and incurable cancer can be relieved of much discomfort to themselves and others.

"Most deaths from cancer should have been prevented by three things: proper mating of individuals without the hereditary predisposition to cancer, the elimination of prolonged irritation, and early recognition by well trained physicians."

Dr. MacCarty answered twelve questions about cancer. He described the disease as "an ungovernable, erratic growth and destructive migration of cells which are normally present in the body."

In spite of almost yearly "discoveries" of the cause of the disease, science has not substantiated any such discovery and knows only two causative factors, hereditary susceptibility and prolonged irritation in the susceptible individual.

Dr. MacCarty stated that only three methods of treatment are known, radical surgery, X-ray and radium. With regard to various sera and salves reputed to cure cancer, he said:

"I believe I have the backing of the greatest authorities throughout the world when I say that no one has demonstrated that such means cure cancer."

He gave five points for the solution of the problem in the light of our present knowledge. These are: education of physicians to recognize early cancer; education of laymen to the necessity of complete health examinations periodically, even when apparently healthy; immediate investigation of sores or lumps that do not disappear in a few weeks, unusual bleeding or discharge; X-ray studies of the stomach in prolonged indigestion; and intermarriage of individuals without cancer heredity.

*Science News Letter, April 4, 1931*

ASTRONOMY

## New Object in Heavens Pronounced An Asteroid

A FAINT speck of light in the heavens, discovered by German astronomers, has been sighted through the 26-inch telescope of the U. S. Naval Observatory and pronounced an asteroid or minor planet.

Two German astronomers, Schwassman and Wachmann of Bergedorf Observatory near Hamburg, who have won fame for many such discoveries, located the asteriod and announced it to the astronomical world. They first sighted it on St. Patrick's Day, and also determined a second position on March 21.

Later an American astronomer, H. E. Burton, determined the position of the rapidly moving object and William M. Brown and John E. Willis of the U. S. Naval Observatory staff completed a preliminary computation of the object's orbit or path in the heavens.

The asteriod is about as far beyond the earth as the earth is distant from the sun. It is receding from the earth and the sun so that it will not grow brighter or approach closer to the earth. It has an orbit about twice the size of the orbit of Eros, the unusual asteriod which has just paid an extraordinarily close visit to the earth. It revolves about the sun once in four and seven-tenths years, the tentative computations of the astronomers indicate. The newly found asteriod is believed to be a rather ordinary member of the family of minor planets that circle about the sun in the space between the planets Mars and Jupiter. There are more than a thousand of these minor planets.

*Science News Letter, April 4, 1931*

NUTRITION

## Rats Thrive on Diet of Canned Food Only

EXPERIMENTS designed to test whether canned foods can be used as the sole source of vitamins A, B and C have shown that laboratory rats and guinea pigs fare excellently on a diet consisting solely of canned goods.

The experiments were made by Dr. E. F. Kohman of the National Canners' Association, Prof. W. H. Eddy of Teachers College, Columbia University, and Celia Z. Gurin and were reported to the American Chemical Society.

A balanced diet of four or five canned foods was fed for five days to the animals, who were allowed to use their own discretion in eating them. After the end of each period of five days a change was made to a new dietary combination. Three generations of rats and guinea pigs have thus dined on 74 combinations of 49 canned articles, and are now in better health than other animals fed on the usual laboratory stock fresh diets.

Previous trials of this kind have tested the deficiency of a particular vitamin in a special foodstuff, and have not sought deficiencies which made themselves felt in later generations. Extremely varied and balanced diets of the kind used in these experiments have failed to give evidence for the belief that canned foods cannot supply all dietary wants.

*Science News Letter, April 4, 1931*

MEDICINE

## Heroic Doses Required to Save Cats After Gland Loss

HEROIC DOSES of the new glandular extract which maintains life in men and animals after loss of or injury to the adrenal glands are necessary to produce desired results, at least in cats, Drs. S. W. Britton and Herbert Silvette of the University of Virginia, report in *Science*.

The cortical extract, socalled because it is obtained from the vital cortex of the adrenal gland, has been prepared by two groups of scientists, Drs. W. W. Swingle and J. J. Pfiffner of Princeton University, and Drs. F. A. Hartman, K. A. Brownell and W. E. Hartman of the University of Buffalo. In the studies at the University of Virginia both types of cortical extracts were used.

The extracts have been used successfully in prolonging the lives of patients suffering from heretofore fatal Addison's disease.

The amount of extract necessary to restore animals that were prostrate as a result of loss of their adrenal glands represented more than a thousand times the amount of cortical tissue normally present in the animal's body, the Virginia investigators found.

"It seems likely that previous observers may not have secured noteworthy effects with their cortical extracts because of failure to employ the heroic dosage necessary," Drs. Britton and Silvette concluded.

While their studies were made on animals, the results are probably applicable to human patients.

*Science News Letter, April 4, 1931*

# IN SCIEN

PSYCHOLOGY

## Scientists Relax To Solve Problems

PERIODS of rest or temporary abandonment of effort are quite essential to the successful research worker, Washington Platt of Syracuse, N. Y. and R. A. Baker of the College of the City of New York, told the American Chemical Society.

Several hundred research workers and directors of research had answered questions as to conditions which are favorable or unfavorable to efficient research. The majority agreed that "problems may be solved when the mind is on the fringe of consciousness."

The mind must be provided with facts, the scientists concluded, but periods of temporary abandonment of creative effort are also quite necessary.

*Science News Letter, April 4, 1931*

CHEMISTRY

## Pill of Immortality Was Goal of Chinese Chemists

THE PILL of immortality was sought by the Chinese alchemists in the third century B. C., long before Europeans began their fruitless search for the Elixir of Life, Prof. Tenney L. Davis and Lu-Ch'iang Wu of the Massachusetts Institute of Technology told the American Chemical Society.

To become a "hsien" was the dream that lured on those early scientists in their quest for immortality. A hsien was "a benevolent supernatural being endowed with extraordinary powers, able to appear and disappear at will, to pass unharmed through fire and water."

The western counterpart of this idea, the Elixir, was probably invented by the Arabs and borrowed from them by European alchemists, said Prof. Davis. The Elixir was a sort of medicine by which ordinary existence was supposed to be prolonged indefinitely.

The obviously different notion of "hsien" is taken as evidence for the independent origin of Chinese chemistry and derives from the philosopher Lao Tzu.

*Science News Letter, April 4, 1931*

# E FIELDS

ECOLOGY

## Moving Dunes Threaten To Wipe Out Forest

OREGON'S "lost forest," a five-mile square tract of pine timber in the isolated interior of Lake county, southwest of Wagontire Mountain, has been reached by advance waves of huge sand dunes which menace its existence. The big dunes are creeping into the tiny forest, more than thirty miles removed from the nearest pine belt, at the rate of about twelve feet a year, before a prevailing southwest wind.

Some of the outlying trees of the compact group of pines on the Oregon plateau are already half covered by the drifting sand. The dunes are moving toward the "lost forest" in a series of waves which extend many miles into the southwest.

Whether the tiny forest of the Lake county plateau will eventually perish as the dunes slowly pile up among the trees is uncertain, but it is known that large tracts of junipers were covered by the sand and killed. The trunks of these sand-killed junipers, stripped of bark and foliage, now stand like ghost trees, white and gnarled, amid sage brush.

Soil where the isolated pines are growing appears to be peculiarly suited to the conifers.

Just to the south of the little forest, a big sand dune has moved over a spring from which a large stream of water flowed about ten years ago.

*Science News Letter, April 4, 1931*

CONSERVATION

## Corn On Cob Saves Wintering Bobwhite

CORN on the cob, appreciated by every true American during the summer, is no less appreciated in the winter by that fine American bird, the bobwhite quail. It is their best source of food when the weather becomes severe and the weed seeds and smaller grain become exhausted or hard to get at.

This is one of the results of a study of a thousand bobwhite carried on by P. L. Errington, a fellow at the University of Wisconsin, which will be announced shortly in a University publication.

Mr. Errington found that bobwhite throve best when they had access to cornshocks, especially when these were arranged with an eye to their comfort, tied at the top and spread rather widely at the bottom. The birds would husk their own corn as they found it inside, and in the shocks they also had shelter from the weather and from most of their predatory enemies.

*Science News Letter, April 4, 1931*

PSYCHOLOGY

## Color-Blind Salesmen Handicap to Firm

IF YOUR wife sends you to a dry goods store to match the proverbial "sample," you very likely leave the actual matching process to the salesman. And if you do there is a strong chance that you may have to take the goods back again—the salesman may be color-blind.

Prof. W. R. Miles and Homer Craig, Jr., of Stanford University, have recently given a color-blindness test to 375 dry goods salesmen who were dealing with colored goods. They found 27 well marked cases of color-blindness. This proportion is just about the same as that which exists in the general population. Dry goods work fortunately does not attract more than its quota of these individuals, but neither are they eliminated by ordinary employment methods. No color-blind salesmen were found in the silk department, however.

Prof. Miles believes that probably at least half of the color-blind salesmen are a handicap to the firms employing them, and should be transferred to departments where it would not be necessary for them to handle colored goods. He recommends the giving of a color-blindness test to all employees.

In some rare cases, color-blindness might be an asset to a salesman. One of the men who failed on the test had had considerable success in selecting ties for customers to match their suits.

"This man perhaps selected the neckties on the basis of brightness," Prof. Miles said. "He probably pulled several from the tie-racks, saying to the customer, 'Any of these ties would go well with your suit.' The customer then selected the best color combination from the group of ties.

*Science News Letter, April 4, 1931*

PSYCHOLOGY

## Physical Exercise Does Not Retard Learning

ENFORCED physical exercise does not affect the learning ability of adolescents—at least when the adolescents are young rats.

In the Laboratories for Research in Athletics at the University of Illinois, Stephen Maxwell Corey tested the ability of several groups of young rats two months old to learn their way through a maze. At two months, a rat is at the stage of development roughly comparable to human adolescence.

Some of the groups took part in athletics, consisting of running about a revolving cage, treadmill fashion. The others led a more quiet life. In the majority of cases, it was found, the exercised rats made the better scores, but the difference was not great enough to be very significant, and the superiority of the exercised animals did not become greater as the amount of exercise was increased.

"Even in the case of the group exercised for five hours a day, which meant approximately six miles of running, the physical exercise appeared to have no decided effect upon the rat's ability to learn or relearn the maze," Mr. Corey says in a report of his experiment.

*Science News Letter, April 4, 1931*

PHYSICS

## Electrons and Protons Paired in Atom Nucleus

ATOMS whose weight-bearing cores contain even numbers of both electrons and protons are twenty times more frequent than all others, Prof. William D. Harkins of the University of Chicago has reported. Of all the chemical elements found on the earth, said Prof. Harkins, 95 per cent. belong to a class in which each building stone of the atomic core has a mate.

The electrons of a pair in the central heart of the atom are not absolutely identical, however. One is spinning in the opposite sense to the other. Thus the nucleus as a whole is free from spin.

These facts throw very important light on the stability of atoms and therefore on the reason why some chemical elements, like radium, are continuously disintegrating into simpler atoms.

*Science News Letter, April 4, 1931*

ECONOMICS-AGRICULTURE

# 200,000,000 Bushels of Wheat To Come From Russia

TWO HUNDRED million bushels of wheat will be exported from Russia year after next, if the Five Year Plan holds up.

This is the prophecy made by Dr. C. F. Marbut, chief of the division of soil surveys of the U. S. Department of Agriculture, in a report prepared for the *Geographical Review*. Dr. Marbut returned recently from an extended scientific journey in Russia, after attending the Second International Soil Science Congress, held last summer at Leningrad and Moscow. He took a leading part in the first congress, held in Washington in 1927.

In an exhaustive survey of the wheat-producing possibilities of Russia and the United States, Dr. Marbut points out a number of important advantages enjoyed by this country's great Eurasian rival. The potential wheat-producing acreage in Russia is much greater than that in the United States. Russia has over 482 million acres of first-quality wheat land, as compared with only 99 million acres in the United States. Of second-quality wheat land Russia has nearly 372 million acres, as against somewhat more than 135 million acres in this country.

In transportation facilities, also, Russia enjoys some advantages over America. Our great grain belt, in the plains states, is remote from tidewater ports, and also lacks navigable rivers, so that all its wheat has to be hauled long distances by rail. The European part of the Russian grain belt, on the contrary, runs right down to the Black Sea and is crossed or bordered by three large navigable rivers. The wheat zone in Asiatic Russia, however, is not so favorably situated as regards transportation.

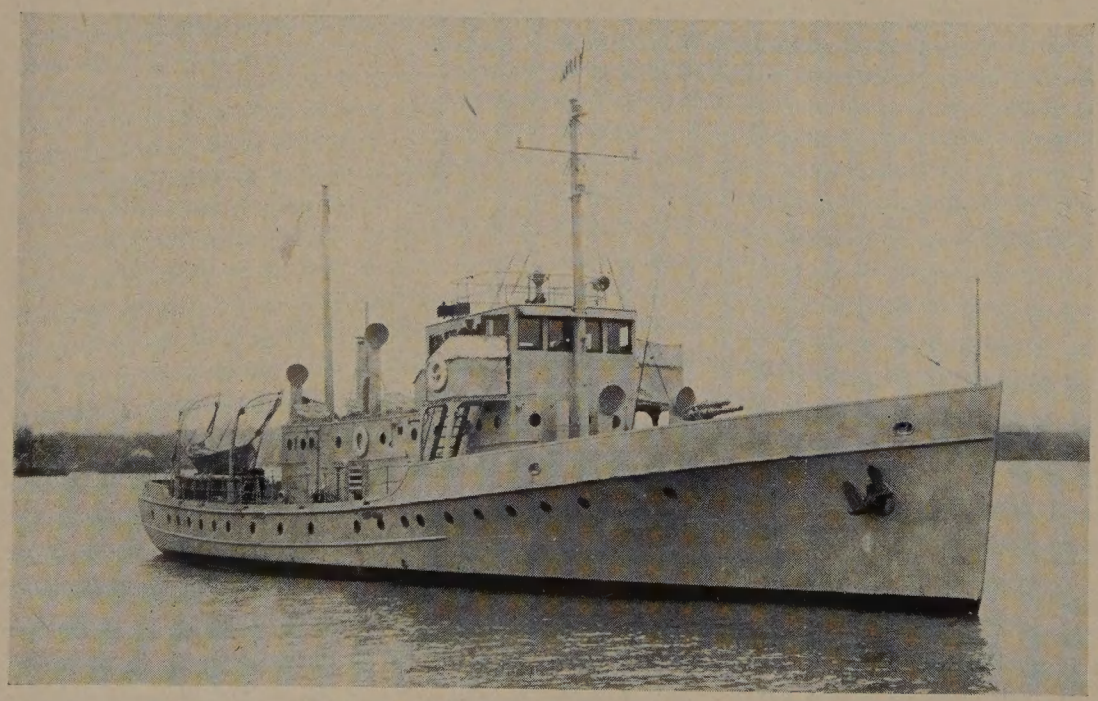
There is a basic similarity between the soil types that are best for wheat in the two countries. The first-quality wheat soil, whether in western America or in southern Russia, is a deep, black earth, known the world over by a Russian name, "chernozem." Second-quality wheat soil is lighter in color and bears the English name "chestnut" or "chestnut brown."

The Russian wheat zone is about two hundred miles wide, extending eastward from the Rumanian border to the region of Lake Baikal, though the best of it stops considerably to the westward, in the valley of the Ob river. The American wheat belt begins in northern Texas and runs to the Canadian line, whence it continues far "up the map" under the Canadian flag.

In both Russia and the United States, the natural wheat land was originally a natural grassland, used by a nomadic population as pasture or hunting-ground. In both countries, the climate of the wheat belt is moderately dry, which is an advantage, for it permits large-scale outdoor operations for long periods every year. The greater part of each wheat belt is at least moderately level, which permits large farms and the use of machinery on the grand scale.

But whereas the rest of the world has already put most of its possible wheat acreage into actual cultivation, Russia has vast reserves of potential wheat land that have never known the plow. And it is that, coupled with the grandiose schemes for farms as big as whole counties, that is causing uneasiness among the non-Soviet agricultural economists at the present time.

*Science News Letter, March 14, 1931*



MEETING ICEBERGS HALFWAY

***The U. S. Coast vessel "General Greene" will serve as a floating iceberg observatory for the assembling of better scientific knowledge regarding these menaces to navigation, and at the same time will supplement the work of the regular ice patrol vessels with advance information from farther north.***

HYDROGRAPHY

## 310 Icebergs Forecast By U. S. Coast Guard

ICEBERGS will invade the North Atlantic to the number of about 310 during the coming season, is the forecast of Lieutenant Commander Edward H. Smith of the U. S. Coast Guard. Commander Smith has for several years made a special study of ice conditions, and has worked out a method of forecasting which he believes will be of great value to the International Ice Patrol in its work of protecting transatlantic traffic during the iceberg season.

The number of bergs anticipated for 1931 is not exceptional, Commander Smith states. The maximum recorded during the modern period of intensive study and reporting of icebergs was for the year 1929, when 1,300 came down out of the North. The lowest figure was for 1924, when 11 were reported.

Iceberg prediction has been made possible by a study of the relation between the average atmospheric pressure over the North Atlantic and the amount of ice drifting southward, covering a period of 47 years. If the average pressure is low, the number of bergs is high, and vice versa. During the past winter the average atmospheric pressure over the North Atlantic has been higher than usual; hence a smaller number of bergs is expected.

*Science News Letter, April 4, 1931*

ARCHAEOLOGY

# Stone Age, Bronze Age and Iron Age In Sweden

## "A Classic of Science"

**Montellius showed that the civilizations of prehistoric man developed in this order. Modern man finds iron easier to work than copper, but our early forebears universally used copper-tin bronze before they learned to reduce iron ores.**

*THE CIVILIZATION OF SWEDEN IN HEATHEN TIMES, by Oscar Montellius, Translated by Rev. F. H. Woods. London and New York, Macmillan,* 1888.

THE HISTORY of the earliest inhabitants of the North was till about fifty years ago shrouded in obscurity. It was not till then that antiquarians began generally to recognize that the antiquities which are dug up from time to time, and the barrows and stone monuments which still abound throughout the country, do not all belong to that part of heathen times which immediately preceded the introduction of Christianity, and of which the Icelandic sagas relate. When Ansgar first came to Sweden in the ninth century, the use of iron was universal in the country, and had been so for a long time. A careful investigation of the antiquities has shown, however, that before that period, now usually known as the Iron Age, there was another, when iron was altogether unknown, in which weapons and tools were made of bronze, a mixture of copper and tin. This period, called the Bronze Age, had, as well as the Iron Age, continued for many centuries. But before the beginning of the Bronze Age Sweden had for a very long time been inhabited by people who lived in entire ignorance of the use of the metals, and were therefore compelled to make their instruments and weapons of such materials as stone, horn, bone, and wood. This last period is known therefore as the Stone Age. . . .

That there was a time when all metals were entirely unknown is clearly seen from the many large finds and the hundreds of remarkable graves containing numerous relics of stone, bone, etc., but no trace of metal. That there was another period when the use of bronze, but not of iron, was known, is equally clear from the large number of hoards and graves which contain weapons, ornaments, etc., of bronze, but no trace of iron; while on the other hand bronze implements are hardly ever found with those of iron. That there was a third period in heathen times when iron was in general use we can see by the first glance at any large collection of antiquities. From this it follows of necessity that the earliest history of Northern culture—the time antecedent to the establishment of Christianity—actually embraces the three great periods which derive their names from the most important material in use during each of them.

And there can hardly be any doubt of the order in which these periods followed each other. That the Stone Age must be older than the Bronze Age is self-evident, and is further proved by the fact that we often find graves of the Bronze Age in the upper part of barrows which have been raised over a grave chamber of the Stone Age which usually lies at the bottom in the center of the barrow, while the converse has never occurred. And our earliest sources of history which throw light on the conditions of life during the last part of heathen times point only to a period when iron was in general use. It follows therefore that the Iron Age must be the last of these three periods.

### The Stone Age

Relics of the Stone Age have been found in almost every country in the world, in England and in France, as well as beneath the classical soil of Italy and Greece, in Egypt, Asia Minor, and India, as well as in China and Japan.

The most important contribution to our knowledge of the Stone Age was made by the discovery of the lake-dwellings in Switzerland—in the winter of 1854-5. Since then remains of these peculiar buildings have been found in many different places, both in Switzerland and other countries. They were built up out of the water upon thousands of piles driven into the bottom of the lake. Many of these buildings had been burnt, or destroyed from some other cause, during the Stone Age; others are later. In many cases the peat formed over the ruins has preserved even the smallest and most delicate parts of their contents. These remarkable discoveries point to a people of the Stone Age with fixed dwelling places engaged in pasturage and tillage, with many other proofs of a higher culture than we are accustomed to ascribe to this period.

That a Stone Age is not necessarily accompanied by an entire want of culture, is shown also by the surprisingly high civilization which existed in Tahiti even before the first visit of the Europeans. And yet the inhabitants of this island were so completely ignorant of metals, that at first they planted the iron needles got from Cook's people in

**WARRIOR OF 300 A.D.**

***This Swedish soldier of the Iron Age wore woolen clothes woven in pattern from green and yellow yarn. His shoes were of tooled leather, his helmet of silver-gilt. An iron coat-of-mail and a wooden shield trimmed with metal protected him from his enemy's sword and arrows. Illustration from Montellius.***

**Dulong and Petit's Law**

**states that the product of the specific heat of a substance and its atomic weight is a constant. It is one of those rules-of-thumb which have been immensely useful in determining the properties of new elements.**

**Mm. Dulong and Petit**

**will tell how they discovered it in**

**NEXT WEEK'S CLASSIC OF SCIENCE**

their gardens, believing that they were shoots of some very hard plant, out of which they hoped that the life was not altogether extinct.

After the Stone Age had come to an end the true meaning of the stone implements was soon forgotten. When they were from time to time found in the ground they were called "thunder bolts" or "Thor's bolts", and were believed to have fallen with the lightning. This belief and this name, both still very general in Sweden, are found also to a remarkable extent in all parts of the world, from Japan to South America. . . .

### The Bronze Age

Before the Stone Age ended the inhabitants of Sweden had raised themselves considerably above the savage state; but, so long as they were completely ignorant of metals, it was impossible for them to reach a higher degree of civilization. But at last the fruits of the civilization attained by the cultured races of the East spread to the distant regions of the North; and through the knowledge of metals, at first only bronze and gold, there began for those lands a new era known as the Bronze Age.

By these words is understood that period in the earliest civilization of the Northern races, when they made their weapons, tools, etc., of bronze, a mixture of copper and tin. Besides bronze, they knew only of one metal, namely, gold. Iron, steel, silver, and all other metals were still completely unknown in these countries.

Before we go further we must call attention to the inaccuracy of an opinion which not unfrequently finds expression, that all antiquities of bronze should be referred by antiquarians to the Bronze Age. Vessels, rings, buckles, needles and the like were, as we might have supposed, still made of bronze after the end of this period, just as they are even in our own day, but generally of a somewhat different composition from that used in the Bronze Age. To this age belong only weapons and edge-tools made of bronze, and such vessels and ornaments as are usually found with them. . . .

We have already mentioned that the end of the Stone Age, and therefore the beginning of the Bronze Age, in the North, must be regarded as having taken place 3,500 years ago. The latest investigations have shown that the Bronze Age proper came to an end in these regions in the beginning of the fifth century, B.C. It lasted therefore about a thousand years. . . .

### The Iron Age

By "The Iron Age" is understood, as we have already seen, that part of *heathen times* in which iron was known. We might certainly say, if we regarded only the proper meaning of the words, that the Iron Age is even now still going on; but for the antiquarian's purposes the Iron Age in Sweden ends with the victory of Christianity over the Asa-gods.

During the Iron Age the inhabitants of Sweden became first acquainted with iron, silver, brass, lead, glass, stamped coins (of foreign production), and learnt the art of soldering and gilding metal, etc., etc. And as works of iron could not, like those of bronze, be produced only by casting, the smith's craft came to have far greater significance than it had had during the Bronze Age. But of the new discoveries of this period one of the most important was the art of writing, which the inhabitants of the North seem to have acquired soon after the beginning of the Christian era. The earliest alphabetical symbols in Sweden —indeed the only ones used in that country during the whole of heathen times—were the *runes*.

*Science News Letter, April 4, 1931*

PHYSIOLOGY

# Migraine Headaches Believed Like Hives on Brain

DEBILITATING migraine headaches, from which four per cent. of our population suffers, are like hives of the brain, it appears from researches of Drs. Ray M. Balyeat and Herbert J. Rinkel of Oklahoma City.

In hives of the skin, there is a dilatation of the blood vessels of the skin followed by swelling due to accumulation of fluid in the tissues. In migraine, the same condition exists in the brain, the Oklahoma City scientists believe.

Nor is this the only resemblance between the two conditions. Migraine, urticaria or hives, asthma and hay fever, and even epilepsy seem to go together. One patient may suffer from one or several of these conditions, and usually one or all of them have appeared in other members of his family, Drs. Balyeat and Rinkel found from their studies of several hundred persons.

Migraine, like asthma, hay fever and urticaria, is caused by sensitization to certain proteins, either in food or in pollens or animal hair. Their method of treatment is based on elimination of the offending protein from the diet or the environment. With migraine, it is usually a dietary protein.

About 4,000,000 people in the United States today suffer from migraine. Of these, at least 1,000,000 are under 12 years of age, Dr. Balyeat calculated.

Migraine is more common among business men, teachers and professors than in the population at large. Day laborers are rarely afflicted by it.

Migraine headaches are generally known as sick headaches, because they are almost always accompanied by nausea and vomiting. The attacks occur at varying intervals, sometimes every two or three weeks and sometimes every two or three months. Once in three weeks was the average.

Typical attacks of migraine have four stages. In the first one the patient usually feels nervous and irritable, sometimes drowsy, and the sleep is often unnatural the night before the headache. The second stage is characterized by faintness or dizziness, spots before the eyes or other visual disturbances. The third stage is while the actual headache and accompanying nausea are present. During the fourth or post-migrainal stage, the patient generally is exhausted, sleepy, and may suffer from a watery nasal discharge, similar to that of a cold or hay fever.

*Science News Letter, April 4, 1931*

ASTRONOMY

# Seldom-Seen Mercury in Evening Sky

## About the Tenth of This Month, As the Dusk Gathers in The West, You May See Planet Even Copernicus Missed

By JAMES STOKLEY

IN the program of celestial events for 1931, April makes a pretty good showing, with an eclipse of the sun, the presence in the evening sky of seldom-seen Mercury, and the occultation by the moon of a moderately bright star.

Very inaccessible, however, is the solar eclipse, which happens on April 17-18. China, Siberia, and the North Pole is the region to which you would have to go if you wanted to see it. To the enthusiastic astronomer, a trip around the world to observe an eclipse is nothing unusual, but no astronomers will observe this one, for it is not total. At no place on the earth's suface will the sun be seen completely covered by the moon. Even when the eclipse is largest, about half the sun's surface will still be visible. Such an eclipse is of no scientific value, even though the astronomers who keep track of the motions of the various bodies, and who prepare the important almanacs that are the Bibles of the astronomer, must figure such an eclipse as closely as any other.

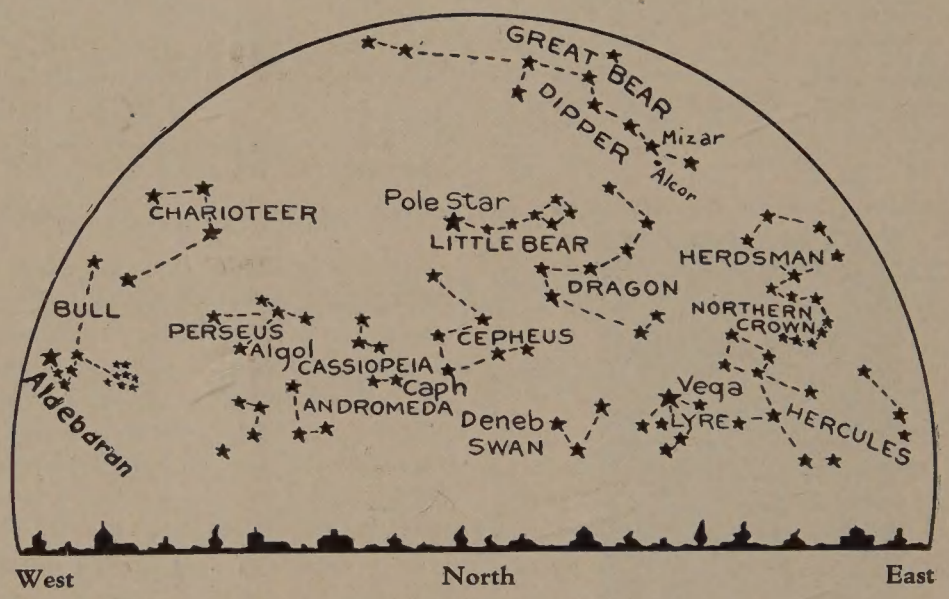
### Visible All Over U. S.

The appearance of the planet Mercury in the evening sky, along with its brothers Mars and Jupiter, however, is something that can be seen in all parts of America. Because Mercury, innermost member of the solar system, is only 36,000,000 miles from the sun, on the average, as compared with 92,900,000 miles for the earth, it is always seen in the sky close to the sun. When the angle from the sun to Mercury and then to the earth is 90 degrees, the former planet is said to be in "elongation." It is referred to as either eastern or western elongation, depending on which side of the sun Mercury appears. On such occasions Mercury escapes from the sun's glare and becomes visible, either just before sunrise or just after sunset.

This is the case about April 10. Mercury is then about 19½ degrees to the east of the sun, so after sunset Mercury is still visible a short distance above the western horizon. When the greatest eastern elongation occurs in spring, as now, the planet is best seen. At sunset the ecliptic, or the line along which the sun and the planets move among the stars, is now almost vertical in the west. In October, on the contrary, the ecliptic slants down to the south. Even if Mercury is then at the same distance from the sun, it is not as high above the horizon and is not as easily seen.

Sometimes Mercury, at greatest eastern elongation, gets considerably farther from the sun than now. Its orbit is a very eccentric one, considerably distorted from a true circle. As a result its actual distance from the sun varies from 28,500,000 miles to 43,350,000 miles. Just now it is near the former figure. The least distance that can separate the sun from Mercury at the time of an elongation is only a little less than its distance on April 10, or about 18 degrees. This is approximately the same as the distance between Betelgeuse and Rigel, the upper and lower stars in the constellation of Orion, which can still be seen in the western sky during the early evening. When an elongation occurs at the time of the greatest separation between Mercury and the sun, they may be as far apart as 28 degrees, which is a little less than the distance from Betelgeuse to Sirius, the brilliant star in the southwest.

Therefore, to see Mercury, one should look to the western evening sky just




The Skies During April

after sunset, about the tenth of the month. For a few days before and after that date, it will also be visible. As the dusk gathers, you will see a brilliant point of light. That is Mercury. Then you will have seen a planet that even the great Copernicus is said never to have viewed.

Through the telescope at this time, Mercury, like Venus at a similar position, will appear as a half-moon shape. This is because it gets its light from the sun, and we only see half of the illuminated surface. Very little detail can be observed on Mercury, but experienced astronomers have observed some markings, and their study seems to indicate that the planet turns once in the same period that it travels around the sun. Thus it probably keeps the same face towards the sun, just as the moon does to the earth.

### Not Healthy For Tourists

Mercury has no atmosphere, so that it would undergo great extremes in temperature. The side towards the sun would be constantly very hot, and measurements of its temperature by Dr. Nicholson and Dr. Pettit at the Mt. Wilson Observatory have indicated it to be about 350 degrees Centigrade. This is about 660 degrees Fahrenheit. Lead melts at 327 degrees Centigrade, so it would be conceivably possible to have oceans of lead on the planet.

On the side away from the sun, the temperature would be exceedingly cold, though no measurements of this region have ever been made. There, perhaps, such common gases as the oxygen and nitrogen of our atmosphere might be frozen into snow, provided those gases were present on Mercury.

In a narrow region between the continually light and continually dark areas, however, the sun would sometimes rise above the horizon and sometimes drop below again. There the average temperature would be more equable, but the extremes would be very great. On the whole, the climate of Mercury hardly commends itself to would-be inter-planetary tourists!

The planets Jupiter and Mars are conspicuous objects in the western sky. The former is high in the west, and its great brilliance and steady, yellowish light make it easy to locate. Above it are the twins, Castor and Pollux, the latter the brighter. To the left of Pollux, about two and a half times the distance between the twins, is Mars, also brilliant, though inferior to Jupiter, and shining with a red light.

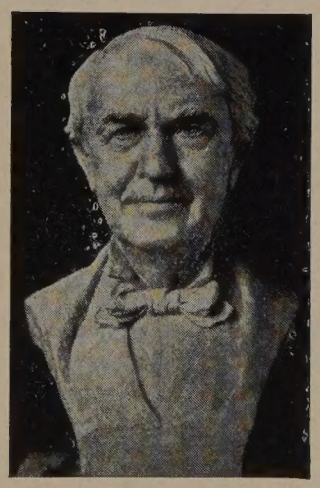
### Moon Eclipses Star

The occultation that is brought by the month of April occurs on the 28th, when the moon occults, or eclipses, the star beta Virginis. This star, only of the third magnitude, is only moderately bright. No star of greater brilliance is occulted during the present year, so this is the best chance the people in the United States have to see one of these interesting events during 1931. High in the south the evening of the 28th you will see the Sickle, of Leo, with the brilliant Regulus at the bottom of the handle. To the southeast, and lower in the sky, is Spica, in Virgo. About half way between Spica and Regulus is beta Virginis, the name indicating that it is the second brightest star in the constellation, Spica itself, known technically as alpha Virginis, being the most brilliant.

On the night of the 28th the moon will be in a gibbous phase, a few days past first quarter. Early in the evening, beta Virginis will be to the east. But as the moon moves eastward through the stars, it gradually approaches, and at 11.12, eastern standard time, at Washington, the moon will come in front of the star. However, the eastern edge of the moon is dark, because it is before the full phase, and so the star will seem to disappear before the moon actually reaches it. A small telescope will show the phenomenon to better advantage. The sudden disappearance of the star is most impressive, and offers conclusive proof that the moon has no atmosphere, for if it had the star would gradually be dimmed, as its light would have to pass through an increasingly thick layer of gas.

Among the constellations seen this month Leo, the lion, is probably the most conspicuous, high in the south. To the southeast is Spica, marking the group of Virgo, the virgin. High in the east is Bootes, the bear driver, marked by the brilliant star Arcturus. Low in the southwest is Sirius, the dog star, marking the Great Dog, Canis Major, and soon to disappear from the evening sky for many months. Orion is almost directly west, and Betelgeuse remains visible after Rigel, the lower star, has descended behind the horizon.

*Science News Letter, April 4, 1931*

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of SCIENCE NEWS LETTER published weekly at Baltimore, Md., for April 1, 1931.
Washington } ss.
District of Columbia }

Before me, a Notary Public in and for the District of Columbia aforesaid, personally appeared Watson Davis, who, having been duly sworn according to law, deposes and says that he is the Editor of the SCIENCE NEWS LETTER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Editor, Watson Davis, 21st and Constitution Ave., Washington, D. C.

2. That the owner is:

Science Service, Inc., 21st and Constitution Ave., Washington, D. C., a non-profit making institution for the popularization of science.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Watson Davis,
Editor.

Sworn to and subscribed before me this 24th day of March, 1931.

[SEAL]

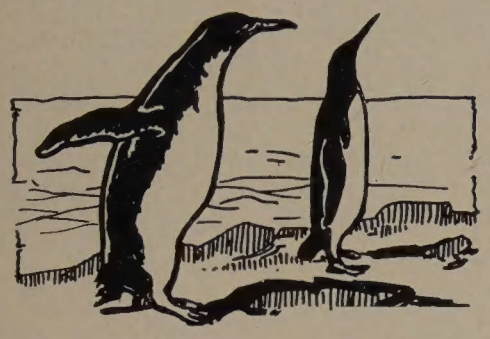
Charles L. Wade.

(My commission expires April 6, 1933.)

ORNITHOLOGY

## *Nature Ramblings*

By FRANK THONE



### Penguins

THE growing interest in the Antarctic has brought into prominence most of the more interesting of the comparatively few animal species that inhabit that desolate end of the world. Among mammals, whales and sea elephants have held the front of the stage; among birds it has been albatrosses and penguins.

The penguins are among the most interesting of all the folk in feathers. They have been "fishers on the wave" for so long that they have totally lost the power of flight, and now use their plumeless wings only as swimming flippers, like those of the seal or whale. This matter of having front-end propellers gives them a tremendous advantage when swimming under water in pursuit of fish, which form their chief food.

They are also distinguished in being about the only creatures in the world, apart from man, who habitually go about in a completely upright position. Other two-legged creatures, in especial other birds, still hold their bodies more or less horizontally, presumably a reminiscence of an original quadruped habit.

This erect habit, coupled with the shortness of their legs, compels them to a very short-strided, waddling, often hopping gait, which looks very comical to our superior human eyes. It must look all right to the penguins, however, for they have never been seen laughing at each other. In fact, they are about the most sober, humorless birds in the world. Their affairs are conducted with the utmost seriousness; in their meticulous dress of black and white they look for all the world like so many little Old-World town councillors.

*Science News Letter, April 4, 1931*

BOTANY

## Paschal Flowers Blossom On Prairies of the West

**See Front Cover**

EASTER-TIDE is remembered in America by two names, one of a place, the other of a flower. When the youth-seeking Ponce de Leon sighted the coast of the New World it was on Easter morning, and accordingly he named the place he had found "Pascua Florida," or Flowery Easter. We have dropped the noun and kept the adjective, as Florida.

When the French *voyageurs* pushed out into the western prairie country they found many strange and beautiful flowers, but none lovelier than the blue chalices that opened up in countless clumps and clusters among the new grass during the fortnight before and after the Paschal feast. So they named them "Easter flowers," and the pious early French "Pasque" has remained to us as a part of the rights of the Louisiana Purchase.

The Pasque flower is strictly a western spring blossom. Its chief range is over the wide plains of the Platte and the upper Missouri, and it climbs the western mountains as high as the plateau of Yellowstone Park. Eastwardly it crosses Minnesota and Iowa, and its easternmost outpost, so far as known, lies on the windswept prairie hills that overlook the Apple river in northern Illinois.

The Pasque flower belongs to the anemone family, which is a very appropriately named flower group. For the word "anemone" is apparently derived from the Greek root meaning "wind," and most anemones are bravers of the wind, displaying their bright blossoms in the open when most other spring flowers hide timidly in the woods. The hairiness of the Pasque flower, which extends even to its bright cup, is an index to this habit, for hairiness is a frequent mark of plants that live in the open and have to fight evaporation every hour of their lives.

*Science News Letter, April 4, 1931*

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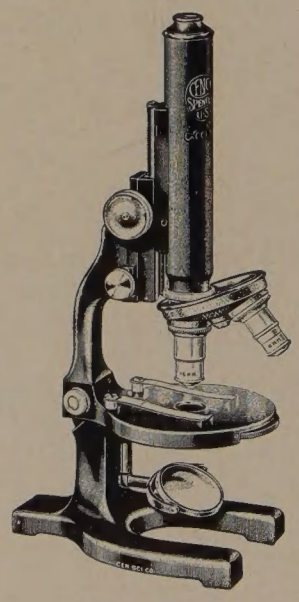

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# First Glances at New Books

**Geography**

PERU FROM THE AIR—George R. Johnson, with text and notes by Raye R. Platt — *Amer. Geographical Society,* 159 p., $5, to libraries $4. Geography from the air can be an instructive and fascinating subject with many angles that the old-fashion geographies missed, as this book demonstrates. It goes without saying that the airplane photographs taken by Lieutenant Johnson are very good indeed. The mighty barriers that the Andes present, the relationship of seaports and other cities to their surroundings, the present state of some of the ancient ruined cities, problems of transportation and other engineering problems, are all more clearly understood when viewed broadly from above. There are 152 illustrations, mostly air photographs. The text, by Mr. Platt, stresses economic significance of the land.

*Science News Letter, April 4, 1931*

**Zoology**

ANIMAL AGGREGATIONS—W. C. Allee —*University of Chicago Press,* 431 p., $5. Prof. Allee's researches have lately been opening up a most interesting and hitherto neglected field in ecological physiology—the ability of masses of animals to resist toxic elements in their environment, to which they would succumb much more quickly if exposed as single individuals. In this book he sums up and extends his results to date, and discusses their implications as they touch upon the work of other physiologists.

*Science News Letter, April 4, 1931*

**Meteorology-Aeronautics**

AEROLOGY — Charles Joseph Maguire—*McGraw-Hill,* 136 p., $2.50. An elementary but technical book on the weather as seen by the aviator. It is a manual to be used by ground schools for the training of aviators.

*Science News Letter, April 4, 1931*

**Psychiatry**

THE PSYCHIATRIC STUDY OF PROBLEM CHILDREN—Sanger Brown II and Howard W. Potter—*N. Y. State Dept. of Mental Hygiene,* 152 pp. A manual for workers in child guidance clinics and other institutions which must solve the problems of problem children. Procedures and principles are set forth very clearly and in detail, with reasons frequently given to show why the course of action is advised. The authors advocate a comprehensive study of the child: psychological, social, and medical.

*Science News Letter, April 4, 1931*

**Astronomy**

THE UNIVERSE AROUND US—Sir James Jeans—*Macmillan,* 351 p., $4.50. A new and revised edition of a current classic of science popularization. Sir James has added discussions of the new planet Pluto, the rotation of the galaxy, and the apparent expansion of the universe which have become important since the first edition of his book.

*Science News Letter, April 4, 1931*

**Industry**

ROCKEFELLER: GIANT, DWARF AND SYMBOL—William H. Allen—*Institute for Public Service,* 619 p., $5. A highly critical biography of one of the leading figures in American business and philanthropy. The author challenges the administration of the many Rockefeller benefactions, questioning whether they have done more good than harm. The Rockefeller industrial activities are also subjected to strenuous inquiry.

*Science News Letter, April 4, 1931*

**Physical Chemistry**

A TEXTBOOK OF PRACTICAL PHYSICAL CHEMISTRY—K. Fajans and J. Wust, trans. by Bryan Topley—*Dutton,* 233 p., $4.95. Based on the accumulated experience of instructors at Munich, Wurzburg and Erlangen. For university and college students and research workers. It is clear without being too detailed in its descriptions and it leaves something to the self-reliance of the student. It is a good translation.

*Science News Letter, April 4, 1931*

**Engineering—Government**

THE DEVELOPMENT OF THE FEDERAL PROGRAM OF FLOOD CONTROL ON THE MISSISSIPPI RIVER—Arthur DeWitt Frank — *Columbia University Press,* 269 p., $4.25. The legislative, administrative and legal aspects of the fight against America's greatest river.

*Science News Letter, April 4, 1931*

**Mathematics**

FIVE-PLACE LOGARITHMIC AND TRIGONOMETRIC TABLES — William W. Burton—*Crowell,* 93 p., $1.25. For college students. It has been checked against Vega's tables.

*Science News Letter, April 4, 1931*

**History—General Science**

THE HISTORY OF SCIENCE AND THE NEW HUMANISM — George Sarton—*Holt,* 178 p., $2. No one can read these three Colver lectures by the most fruitful of today's historians without acquiring some of his enthusiasm and his insight into the essential nature of the history of civilization. Dr. Sarton is building a bridge between humanists of the old school and scientists who have no knowledge of the past and no appreciation of beauty. He visualizes the dawn of a new age, the age of a New Humanism (not the philosophic variety of recent exposition, but a "new culture, the first to be deliberately based upon humanized science.") In the illuminating chapter, "East and West," Dr. Sarton tells concisely the true story of the so-called Dark Ages when Islam carried the torch of science lit by the Greeks and their intellectual ancestors of the East, added fuel to its flames and then handed it on to the western civilization of which we are a part.

*Science News Letter, April 4, 1931*

**Child Health**

CHILD HEALTH—Mrs. Norma Selbert—*Saunders,* 261 p., $1.60. Designed for classes in adult education and child care. This small volume is a concise, non-technical presentation of the latest theories and methods in care of children of all ages.

*Science News Letter, April 4, 1931*

**Mechanical Engineering**

MACHINE SHOP WORK — Frederick W. Turner, Oscar E. Perrigo, Howard P. Fairfield—*American Technical Society,* 400 p., $2.50. A treatise on approved shop methods now in a revised edition.

*Science News Letter, April 4, 1931*

**Mechanics**

APPLIED MECHANICS—Norman C. Riggs—*Macmillan,* 328 p., $3.75. A textbook by the professor of mechanics at the Carnegie Institute of Technology.

*Science News Letter, April 4, 1931*

**Sociology**

COMMONWEALTH FUND ANNUAL REPORT 1930—85 p., Free. Reviews the valuable activities carried on under the Commonwealth Fund in the fields of education, public health, mental hygiene, child guidance, and legal research.

*Science News Letter, April 4, 1931*